

Hardy Fern Foundation Quarterly



THE HARDY FERN FOUNDATION

P.O. Box 166

Medina, WA 98039-0166

Web site: www.hardyferns.org

The Hardy Fern Foundation was founded in 1989 to establish a comprehensive collection of the world's hardy ferns for display, testing, evaluation, public education and introduction to the gardening and horticultural community. Many rare and unusual species, hybrids and varieties are being propagated from spores and tested in selected environments for their different degrees of hardiness and ornamental garden value.

The primary fern display and test garden is located at, and in conjunction with, The Rhododendron Species Botanical Garden at the Weyerhaeuser Corporate Headquarters, in Federal Way, Washington.

Satellite fern gardens are at the Stephen Austin Arboretum, Nacogdoches, Texas, Birmingham Botanical Gardens, Birmingham, Alabama, California State University at Sacramento, Sacramento, California, Coastal Maine Botanical Garden, Boothbay, Maine, Dallas Arboretum, Dallas, Texas, Denver Botanic Gardens, Denver, Colorado, Georgeson Botanical Garden, University of Alaska, Fairbanks, Alaska, Harry P. Leu Garden, Orlando, Florida, Inniswood Metro Gardens, Columbus, Ohio, Lewis Ginter Botanical Garden, Richmond, Virginia, New York Botanical Garden, Bronx, New York, and Strybing Arboretum, San Francisco, California.

The fern display gardens are at Bainbridge Island Library, Bainbridge Island, WA, Lakewold, Tacoma, Washington, Les Jardins de Metis, Quebec, Canada, University of Northern Colorado, Greeley, Colorado, and Whitehall Historic Home and Garden, Louisville, KY.

Hardy Fern Foundation members participate in a spore exchange, receive a quarterly newsletter and have first access to ferns as they are ready for distribution.

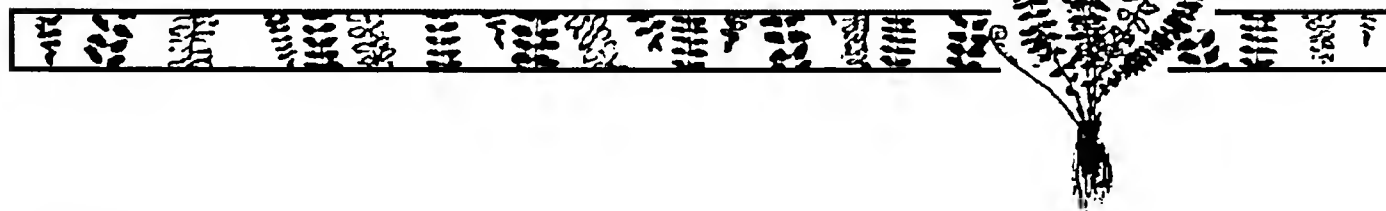
Cover Design by Willanna Bradner

HARDY FERN FOUNDATION QUARTERLY

QUARTERLY

Volume 13 • No. 3 • Editor - Sue Olsen

ISSN 1542-5517



President's Message 62-63

John van den Meerendonk

Dryopteris clintoniana 64-65

James Horrocks

Fern & Fern Allies of California Workshop 66-69

Robin Halley

New Members 69

A Symphony in Grey - The Fern Garden
at the Whitehall Historic Home 70-72

Ralph Archer

Ferns of Early Spring 73

Joyce Descloux

2002 Garden Evaluations 74-86

Forms of the American Christmas Fern (Part III) 86-96

John D. Scott

The Spore Exchange Needs You!

Please send your spores to our new Spore Exchange Director:

Katie Burki
501 S. 54th St.
Tacoma, WA 98408

President's Message

Summer 2003

The Annual HFF Fern Festival Sale and Lecture held this past May 30 and 31st was a huge success. More fern species and varieties were offered than ever before and in greater quantities, with record sales over the two day event. We members of the board certainly see an increased interest in ferns and fern gardening. Board member and Fern Curator, Michelle Bundy again put on the Fern Propagation Workshop to the delight and appreciation of all who have an interest in growing ferns from spore. Sincere thanks to the HFF Board, Members, and Volunteers for their planning and work in setting up and running this truly remarkable event.

The lecture by HFF Board Member Bors Vesterby on Keying Washington Native Ferns was both interesting and informative. Bors is developing a totally new method in keying out ferns. The Key is entirely photographic and designed to simplify identification of ferns in the field. To be able to develop a new method to key out ferns (and in the future, possibly other plant groups) is a remarkable achievement and undertaking. The beautiful digital photographs of the ferns, showing multiple images of each fern, their morphological features, and of ferns in their native habitat were not only beautiful to see, but are the basis for the key itself. Thank You Bors for the wonderful presentation.

I have now taken over as President of the Board from our immediate Past President, Pat Kennar. I thank the Board for their confidence in me in granting me this position. I will certainly rely on my fellow board members' support and knowledge in fulfilling my duties.

A sincere Thank You to our immediate Past President, Pat Kennar, who has done a remarkable job these past three years. Pat took over his term of President early due to the declining health and passing away of Past President, John Putnam. Pat's pleasant demeanor, interest and dedication have been instrumental in the smooth running of the HFF. It has been a pleasure attending board meetings and events. Of course Pat continues on the Board and I will certainly lean on Pat in my two year term as President.

Two major events will keep us occupied in the coming months. First, in July, Board Member Sue Olsen and the HFF will serve as hosts to members of the British Pteridological Society, who will be visiting our part of the Pacific Northwest. Sue has developed a wonderful and impressive tour. A full schedule of trips to the Olympic Peninsula and both sides of the Cascade Mountain Range, along with visits to numerous private and public gardens will more than meet the interests (and stamina) of the most discernable fern, nature and garden enthusiast. This is truly a remarkable corner of the world, and the HFF is privileged to show and accompany our BPS guests on this fern, nature and garden foray.

Secondly, the HFF has been given permission to create a Fern Display Garden at the Washington Park Arboretum located in the City of Seattle. The Arboretum is administered jointly by the University of Washington and the City of Seattle, and is one of the premiere plant collections of woody plants in the world. The Fern Display Garden will be located directly adjacent to the Visitors' Center in an area called the Signature Garden. The Signature Garden was developed by the Arboretum to showcase various plants, and or planting/design schemes by various plant, landscape or garden associations. We are honored and thrilled to be allowed to build a Fern Display Garden in this very visible and public space. We board members already have design ideas and are making lists of potential ferns, locating and accumulating mature ferns for incorporations in this garden which will be installed this October.

Again, a Thank You to all who have made this years' Fern Festival a great success and the plant event not to be missed. Happy fern gardening to all.

Best Regards,

John van den Meerendonk

President

DRYOPTERIS CLINTONIANA

Clinton's Wood Fern

James Horrocks - Salt Lake City, UT

Dryopteris clintoniana is a fertile hybrid which occurs from eastern Canada down through Maine and New Hampshire to Wisconsin, northern Ohio and Indiana, south among the Alleghenies to North Carolina and West Virginia. It is not considered uncommon but it may be missing from wide areas. Cytological studies suggest this fern is an hexaploid hybrid cross between the tetraploid *D. cristata* and *D. goldiana*, a diploid. Both the fertile and sterile fronds are similar to *D. cristata*, but on a larger scale, being nearly twice the size in some locales. This interesting species was discovered in the nineteenth century by George William Clinton, for whom it was named, and was originally considered a variety of *D. cristata*. It is native to swamps and wet woods and thickets, growing in a vase-like pattern from an erect crown in sub acid soil that is rich and deep. *D. clintoniana* hybridizes with *D. carthusiana* to produce *D. x benedictii*, with *D. intermedia* to form *D. x dowellii*, with *D. marginalis* to produce *D. x burgessii*, and also with *D. celsa*. It also back crosses with both parent species *D. cristata* and *D. goldiana*.



*Dryopteris
clintoniana*

Description:

The rhizome is short-creeping, stout and chaffy sporting large pale-brown scales and producing a vase-like whorl of stiffly erect fronds. The stipe, being over ½ the length of the blade at times, is concolorous, bearing pale-brown to somewhat bicolorous scales with darker brown centers at the base. The fronds are 16 to as much as 48 inches long and are markedly erect. They are semi-evergreen, oblanceolate, that is, narrowly oblong, and pinnate-pinnatifid. The fronds may be subdimorphic, the sterile fronds being shorter than the fertile, a characteristic more strongly expressed in *D. cristata*. Unlike *D. cristata*, in *D. clintoniana*, the fertile fronds are not conspicuously narrowed toward the base and the

pinnae do not tilt or twist in a horizontal plane. The pinnae are deeply divided and the pinnules nearest the main stem may be partially divided again. The lower pinnae are elongate-triangular to ovate-oblong. The upper pinnae are oblong, gradually tapering for the most part to a sharp tip, with appressed-serrate pinnules. The large sori are closer to the midveins than the margins and have a glabrous, kidney-shaped indusium.

Culture:

Dryopteris clintoniana is a robust, very hardy (zone 3) species that is an excellent plant for the moist shaded garden. An elegant species, it grows well in medium light in a damp, somewhat acidic soil that is rich in humus and well mulched. Protection from strong winds is advised. Clinton's Wood Fern makes a very nice single specimen but is particularly striking in mass plantings. It is well worth having if the soil can be kept damp and mulched well to prevent it from heating up.

References:

The Fern Guide (1961) Edgar T. Wherry, Double Day, New York

Field Book of Common Ferns, (1949) Herbert Durand, G. P. Putnam's Sons, New York

Ferns to Know and Grow (1984) F. Gordon Foster, Timber Press, Portland, OR

Ferns for American Gardens (1994) John Mickel, Macmillan Publishing Co., NY.

A Field Manual of the Ferns and Fern Allies of the United States and Canada
(1985) David B. Lellinger, Smithsonian Institution Press, Washington, D. C.



Inventory Reduction Sale Flier on Fern Publications

Contact:

Marketing Department

THE NEW YORK BOTANICAL GARDEN PRESS

200th Street & Kazimiroff Boulevard

Bronx, New York 10458-5126 USA

(718) 817-8574 • fax (718) 817-8842

hjoseph@nybg.org • www.nybg.org

Ferns and Fern Allies of California Workshop

Presented by Dr. Alan Smith and Ruth Kirkpatrick

University of California, Berkeley

Reported by Robin Halley, San Diego

The first warning from a friend about an upcoming fern event came in the second week of January. Layne Huiett volunteers with the Jepson Herbarium to organize classify and identify plants. She was a co-adventurer on other fern excursions and sent an e-mail note:

"I wanted to let you know about this years' fern class sponsored by the Jepson Herbarium on California Ferns."

The Jepson Herbarium shares space with the University of California Berkeley Herbarium and the class was scheduled for the UC Berkeley Botanic Garden (BBG). The class was on Saturday and Sunday, April 5 and 6 and was officially titled "Ferns and Fern Allies." After reading the description of the class, this seemed to me to be a bit of a stealth title as we were going to investigate a variety of topics including characteristics of xeric ferns, the fern life cycle, identification of fern materials from keys, and the latest research on the relationships both within the fern family and between ferns and flowering plants. It looked exciting, but I wasn't sure if I could arrange the time.

The second invitation from a friend came from my Bakersfield friend, David Schwartz, who was sweetening the pot. If I would come up a day early, we could go fern hunting in northern California. Our mutual friend, Judith Jones from Seattle, was going to come down for the workshop and we could all go out and play.

As you may have guessed, in the fullness of time I was able to make the space in a busy work calendar. I signed up for the class and on Thursday afternoon, April 3rd, my wife Linda, our two dogs, and I drove up to Berkeley from San Diego for a weekend of fern frolics.

Friday morning dawned. Our party of three had grown to a party of five with the addition of Phillip Hammond, from San Francisco, and Judith's friend Vanca. We considered a variety of excursion destinations and settled on Mount Tamalpais, across the Richmond bridge on the San Francisco side of the bay. We piled all five of us and our day hiking gear into my rented Camry and off we headed for Mill Valley and Mount Tam.

Phillip acted as guide and docent for our excursion. We drove up to the head of the Bootjack loop trail and picked a two-mile subsection of the six-mile trail to explore. Climbing up out of the trees we came into a small meadow featuring a 15-foot-wide newly grown up stand of Bracken Fern (*Pteridium aquilinum* var. *pubescens*).

We climbed up to some granite boulders where we found the *Aspidotis-Cheilanthes* hybrid that I still call *Aspidotis carlotta-halliae*. The latest findings put the *Aspidotis* back into *Cheilanthes*, again. A little further up the hill tucked under a granite ledge we find one parent of the hybrid, *Aspidotis densa* or Indian Dream.

(Ed note.....does anyone know the origin or meaning of the common name?)

The buckeyes and the native coast iris, *Iris douglasiana*, are coming into bloom and cover the shade spattered hillside. As we wander in and out of the trees, we find more ferns. Goldback fern, *Pentagramma triangularis*, grows both by the rocks and as a understory plant with the Manzanita, Chamise, and Toyon. In the sunnier spots, the California Lilac, *Ceanothus*, is also in bloom.

Back into the trees on a long cross, we encounter *Polypodium californicum* growing across a bed of moss on a large boulder. The lush green is almost breath taking.

At the top of the hill, Phillip knows a special spot where we find some of the xeric ferns on the mountain, Birds-Foot Fern (*Pellaea mncronata*), Coffee Fern (*Pellaea andromedifolia*), and the Coastal Lip Fern (*Cheilanthes intertexta*). We also found Wallace's Spike Moss (*Selaginella wallacei*), a newt, *Adiantum jordanii*, a bunch of lupine, and the other *Aspidotis*, the California Lace Fern (*Aspidotis californica*), along the trail at the top of the hill.

The day was cool and the gusty wind made it cooler on the unsheltered meadows near the crest of the trail. We did stop to enjoy the beautiful panorama of trees, water, sky, and city set out before us, before ambling (botanists never hurry or scurry along a trail) back down the hill.

At the foot of the trail we came out a couple of hundred yards from the car, so we crossed the road to follow a stream through a small grove of redwood trees and were immediately rewarded with swathes of Sword Fern (*Polystichum munitum*) and a lovely stand of Giant Chain Fern (*Woodwardia fimbriata*) with seven foot long fronds.

Returning to the car, we set to return to the Berkeley side of the bay, but couldn't get past a large nursery center ("the car just sort of steered me here") for a short visit and a few purchases.

Saturday morning dawned a little cool and overcast and I met several of the gathering students in the parking lot outside the BBG. We exchanged change for the parking meter and wandered over to the classroom.

We have used the same room at several other Jepson workshops I have attended. This time, however, it was transformed with live plant material and dozens of herbarium sheets that spoke to the topic of California ferns. Most of the live plants were being grown by doctoral candidate Ruth Kirkpatrick for her thesis on fern adaptations to xeric conditions. Each of us had a dissecting microscope to use for our closer looks at the ferns.

Dr. Alan Smith was the workshop leader. He introduced himself and Ruth and provided an overview of the course to the 20 or so students. Alan started off with a discussion of the objectives of the course and then discussed California ferns and ferns allies. He made the point that much of the habitat is arid and in many areas we get winter rains but none in summer. Alan handed out the 2002 checklist of California pteridophytes with a special identifier for the 43 or so species that have been found in Marin County.

continued on page 68

Ferns and Fern Allies of California Workshop *cont. from page 67*

Next, the focus changed to the features of a fern. This served as a refresher for many of us and, for a couple of near novices, an important introduction to the differences in morphology between ferns and most other flora. We discussed the purpose of dichotomous keys and how to use them. Alan took us through a mock identification of a fern from a key and then set us out on our own to identify ferns in the room from the keys. He had us start from the very top of the key (1. Leaves linear or scale-like versus Leaves with well-developed blades, not linear or scale-like) and work down to a specific fern and he had us work up from what we thought was a particular fern to the top of the key as a means for verifying our nominal assumption. He had us compare closely related species to see the way the keys helped to differentiate them. We talked quite a bit about some of the terminology used in keys that really required experience with the keys to know exactly what it meant (what exactly is “scale-like?”).

For breaks we went out and toured the gardens. On one outing, Alan and Ruth led our pack of botanists to the California ferns in the garden to get more familiar with them in situ. On another tour we visited the growing houses where the BBG coddles some of its more unusual ferns and grows things up for placement in the gardens. On still another tour, we visited non-California ferns in the garden, including the 15-foot wide patch of *Cheilanthes lindheimeri* which as always is awe inspiring.

At lunch time we also went and visited the garden. One time we spent time checking out the relatively newly replanted xeric fern garden that has over 40 species of xeric ferns. Another time we visited the Fern House with its many tropical treasures and from there the bookshop and gift store.

After our first keying exercise, Alan Smith and Ruth spent some time talking about xeric and other California rock growing ferns. Then we went on to more keying practice.

After lunch and more keying practice (we're beginning to get quite good), Dr. Smith presented a very interesting slide show on ferns growing in lava tubes and sinks. It turns out that even in very hostile territory, at the bottom of volcanic holes, there is light, moisture, food (birds and bats live in the holes, too), and even temperatures that foster the growth of ferns.

Then more identification and the end of day one.

Sunday morning also came up pretty. Berkeley can be cool but sunny at that time of year and it was. Our first talk for Sunday was Ruth Kirkpatrick on fern sex. She thought it very appropriate as, after all, when she finishes her PhD she will be Dr. Ruth. We got a very spectacular set of micrographic slides showing the spore delivery mechanisms, ovaries, antheridia, eggs, sperms, and fern zygotes. We also talked about alternative methods of reproduction such as adventitious growth (bulbils) and apogamy, where the fern creates clones without the need for fertilization..

We went back to keying, once more, taking a careful look at the material provided. Then, Ruth talked about the findings she has made in her research regarding the many adaptations made by the xeric ferns to live and reproduce in water poor areas. Her research focuses on California Pellaeas and their mechanisms for desiccation tolerance.

After lunch, Alan Smith presented a discussion on California ferns in a global perspective. Alan is particularly versed in the area, as he and Dr. Robbin Moran of the New York Botanical Garden are studying the relationships between ferns in the Americas and in Africa. It was somewhere in here where we got back to fern clades and the latest research on the relationships between the fern families. More interesting to me, however, is the recent theory that flower and ferns have a common ancestor, rather than ferns being an ancestor of the flowering plants.

Our final exercise was to create our own dichotomous keys to a variety of species with a genus and then to test the keys.

This was a class full of interesting and diverse people with many different reasons for attending the class; excellent instructors and support staff, good supplies of ferns to identify, and lots of ferns to see out and about. If you're excited about ferns, it was a great way to spend a weekend.



Welcome New Members

Prazska Botanicka

Jayne-Alice Batie

Pam Perryman
and Bob Whitman

Jerry and Carolyn Doherty

Debra Hardi

Gail Harte

Donald Haslam



THE HARDY FERN FOUNDATION
QUARTERLY
The Hardy Fern Foundation Quarterly is published quarterly by the Hardy Fern Foundation, P.O. Box 166, Medina, WA 98039-0166.
Articles, photos, fern and gardening questions, letters to the editor, and other contributions are welcomed!
Please send your submissions to:
Sue Olsen
2003 128th Ave SE,
Bellevue, WA, 98005
Newsletter:
Editor: Sue Olsen
Assistants: Michelle Bundy
Graphics: Willanna Bradner (cover design)
Karie Hess (inside design)

A Symphony in Grey—The Fern Garden at the Whitehall Historic Home

Ralph Archer - Louisville, KY

Several years ago, Whitehall Historic Home and the Hardy Fern Foundation established a small fern display garden in a wooded area west of the main house. It included a number of ferns and woodland plants donated by local gardeners as well as the Hardy Fern Foundation. It became apparent that the lack of a close supply of water to help new plants through dry periods significantly limited the success and growth of



Whitehall

the fern garden. Recently, the Whitehall Board, with a matching grant, provided a ready water supply to several garden areas, including the fern garden. As a result, it was decided to expand the fern display area.

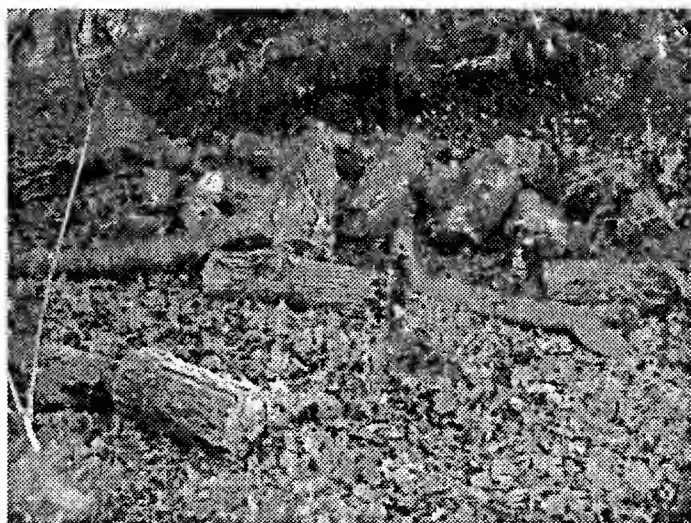
An area which had just been cleared of *Euonymus*, was planted as a fern display bed with a number of ferns, which were donated by the HFF and several HFF members. There are fourteen Genera, forty nine species and fifteen cultivars in the display area. Sixteen are Kentucky native ferns, with many of these locally native. There are a number of non-native ferns that do very well in this area, such as a variety of Japanese painted fern cultivars. These are 'Silver Falls', 'Wildwood Twist', 'Branford Rambler' and 'Ursula's Red' as well as two hybrids, *x Ghost* and *x Branford Beauty*. The ages of the ferns range from one year for some in the new bed to six or seven in the original garden. The Japanese painted fern cultivars are the youngest and will take several years to grow to a mature size and color display. Other ferns, including *D. celsa*, *intermedia*, *marginalis*, *ludoviciana* and *x australis*, were two to three years old when planted last fall. These appeared to be relatively mature this spring. The ferns were planted around and between two long pieces of a decayed log which bisects the fern bed. Large pieces of tree trunks were used to define the front edge and one side of the bed. The remaining sides are defined by log lined paths.

A plan for a woodland garden to complement the fern display evolved as work on the fern bed progressed. It was decided to start by cleaning the woodland of the brush and tree limb piles still present from previous removal of trees and bushes, and by adding new paths. The paths were to be lined with pieces of large branches or small trunks. Removal of the wood started during

the winter and is well under way at the present time. Two new paths through the wooded area were completed and an additional area was cleared of Euonymous.

After some discussion, it was decided to build stumperies in order to use the large pieces of tree trunk and branches. A stumperie is a garden design first planted in the early nineteenth century in England. It is the equivalent of a rock garden, but is made with tree stumps and logs instead of rocks. Ferns and other woodland plants are planted in and around the logs in crevices as well as in hollowed out stumps. The finest one currently in existence, according to some reports, is at Highgrove, the private residence of H.R.H., the Prince of Wales.

The first of the stumperies, Stumperie No. 1, has been completed. The first section was started last winter. After the logs were placed, dirt and humus were added about a third of the way up the logs to fill in between the logs. The soil was allowed to settle for about eight weeks before planting commenced. It was planted in early spring with a number of *Athyrium* 'Ghost' as background ferns, a number of *Dryopteris oreades* in the center and four



Before the stumperie



After the stumperie

Brunnera macrophylla cultivars ('Silver Wings', 'Langtrees', 'Variegata' and 'Jack Frost') in front. A *Cimicifuga ramosa* 'Brunette' and a *C. ramosa* 'Hillside Black Beauty' were planted on either side. The grey shades of various plants is complimented by the grey coloration of various pieces of wood. This led to the name for Stumperie No. 1 as "A Symphony in Grey". Later this spring, a major expansion was completed. It was planted the later part of May with an assortment of ferns, wild gingers and woodland native plants. It added about one and a half times the previous size to the planting.

The original fern display area has been cleaned and a number of woodland plants were added last fall. Other work done this spring included planting additional species of ferns in the display bed and planting several newly cleared areas with a variety of woodland plants and ferns. *Polypodium vulgare* was planted in hollowed out stumps to see if that is feasible in this area. It has been reported that *P. vulgare* is especially good for this

continued on page 72

A Symphony in Grey *continued from page 71*

purpose. However, all the experience presently known has been either in England or the Pacific Northwest. At the present time, the results are not encouraging as several of the newly planted ferns are not showing signs of becoming established.

Over the next few years, we plan to continue to clear areas of Euonymous and debris to expand the woodland garden, stumperies and fern display bed. A major project involves a woodland rock area. Three large pieces of rock have been moved into a part of the woodland and have been set in place. It is planned to bring in several more as suitable pieces are found. When all have been set in place, they will provide a habitat for a variety of ferns and rock garden plants.

The fern garden at its inception was the result of local people and the Hardy Fern Foundation, who provided ferns and woodland plants, and the Whitehall Historic Home, who provided the room to plant them. They deserve a big "Thank You." All the people who made it possible to start this major expansion also deserve a big "Thank You Very Much". The matching grant from Ms. Tina Ward-Pugh was instrumental in providing a ready water supply. The HFF donated a number of ferns. Ms. Sue Olsen of Foliage Gardens in Bellevue, WA. donated a number of newer fern cultivars. Mrs. Margaret and Mr. Robert Kulp donated a garden size chipper, which was a great help in cleanup. Mr. Doug Megginson donated much time and effort to the cleanup as well as the use of his large chipper. The woodland rock area was made possible by a grant from HFF member, Ms. Mary Anne Thornton. Mr. Gene Bush of Munchkin Nursery and Gardens donated a considerable number of different woodland plants for the woodland garden planting. Finally, all of this was made possible by effort of the people of Whitehall, Ms. Susan Goslee, Mr. Mike Hayman, Mr. David Fothergill and especially Ms. Annie Wendt, the Head Gardener and Mr. Brad Kremer, who recently joined the staff. Ms. Wendt's eye for artistic design was crucial and Mr. Kremer did the heavy work with the Stumperie No. 1 expansion and planting.

In closing, our ambition is to provide a woodland shade garden where people can see not only the many ferns which will grow in our area, but also a wide variety of woodland plants. We plan to plant a variety of the wonderful foliage and flowering plants that shine in the darkness and light up the shade garden. Our hope is that people will enjoy this garden in the shade and be inspired to plant their own.



Ferns of Early Spring

Joyce Descloux - Randolph, NJ

Winter's heavy snows melted away through March to reveal the evergreen ferns again. Most are entirely flattened or are in other aspects of disarray – bent, broken, or curled, some more brown than green.

But three appeared in almost unblemished condition, looking as good in earliest spring as they did before the snows: *Dryopteris bissetiana*, *Polystichum braunii* and a new holly fern planted last spring, *Cyrtomium balansae*.

The most spectacular of these, being the largest is the *Dryopteris bissetiana*. Its two-foot fronds, bright apple green, fan out horizontally in all directions, a veritable fountain of fern. How handsome a row of these would be along a walk or wall! Its new fronds don't appear until June first, later than most, so its good looks are especially important at this time.

I have near it the very similar (but not identical) *Dryopteris varia*. This is not as well constructed, and seems a poor impostor next to the real *D. bissetiana*.

Polystichum braunii, a northeast native, thrives on an exposed hillside. It sends up new fronds by mid-April, well before the old ones decay, so they have to be removed for appearances. Near it the Asian *P. makinoi* is also hardy and respectable looking with new fronds by May.

Cyrtomium balansae is an exciting find. I grow several kinds of *Cyrtomium*, and they are all hardy, but not really evergreen in a winter such as we had. But two Korean *C. balansae*, planted just last year, were perky through heat and drought last summer and indifferent, also, to cold, ice, snow and late winter sun, with heavy new growth in mid-May, and many more fronds per crown than others I grow.

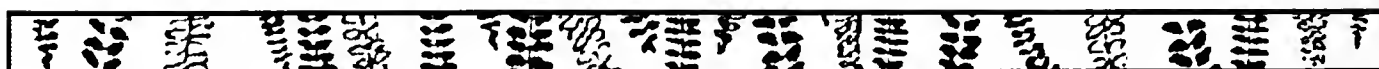
Some other evergreen ferns morph quickly into spring mode. *Polystichum retrosopaleaceum* is one of the earliest to rise with stunning shaggy fronds unfurling from golden-scaled crosiers. It makes a graceful and elegant specimen fern.

Dryopteris pycnopteroides has long slender pinnules that uncoil from black-scaled crosiers to make an elegant crown of erect fronds. It tolerates high sun better than most ferns as long as it is well watered.

Even in a late cold year such as this nearly all established ferns are in full growth by June first. The laggards are various cultivars of the *Dryopteris erythrosora* group. They take a long time to uncoil from crosiers, all the better to enjoy the transitional ruddy spring color of the unfurling fronds.

Some gardeners routinely cut off old growth of evergreen ferns before the new fronds appear. I prefer to wait until it is sere or brown, as I think it protects the emerging new growth and also contributes nutrition to the plant as long as it is still green.

2002 Garden Evaluations



Garden name: Coastal Maine Botanical Gardens

Genus, Species, Variety or Cultivar	Year Planted	# Of Ferns Alive	Average Frond Length (In.)	Has It Borne Spore In The Past Year	Garden Worthiness Rate 1-5 Low to High
<i>Adiantum aleuticum</i>	1999	3	22 in.	yes	5
<i>Athyrium filix-femina</i> 'Frizelliae'	1999	3	5 in.	no	4
<i>Dryopteris cristata</i>	1999	2	20 in.	yes	4
<i>Dryopteris lacera</i>	1999	2	18 in.	yes	5
<i>Dryopteris x australis</i>	2000	2	18 in.	no	4
<i>Dryopteris villarii</i>	2000	2	15 in.	yes	3
<i>Dryopteris pycnopteroides</i>	2000	3	14.5 in.	yes (plants vary in health)	3 - 5
<i>Dryopteris polylepis</i>	2000	3	14 in.	yes	5
<i>Dryopteris remota</i>	2000	3	22 in.	yes	5
<i>Adiantum aleuticum</i>	2000	3	25 in.	yes	5
<i>Dryopteris crassirhizoma</i>	2000	3	17 in.	yes	5
<i>Dryopteris filix-mas</i> 'Crispatissima'	2001	3	8 in.	no (some insect damage)	4
<i>Athyrium filix-femina</i> 'Branford beauty'	2001	3	15 in.	yes	5
<i>Dryopteris hondoensis</i>	2001	3	10 in.	yes	3
<i>Polystichum aculeatum</i>	2001	3	10 in.	yes	5
<i>Dryopteris scottii</i>	2001	2	6 in.	no	3

**THE FOLLOWING FERNS ARE IN THE HFF GARDEN AT CMBG
BUT WERE DONATED OR OTHERWISE ACQUIRED**

<i>Asplenium trichomanes</i>	2001	3	3 in.	yes	5
<i>Athyrium niponicum</i> 'Pictum'	1998	3	12 in.	yes	5
<i>Polystichum munitum</i>	2000	1	31 in.	yes	5

In both the months of May and June, temperatures were below normal and rainfall exceeded normal. Then, in July and August, the reverse was true; temperatures exceeded the average and drought conditions set in.

Here are temperatures, monthly records, and 30-year averages, for Wiscasset, ME, which is very close to Boothbay. Precipitation figures also included.

May 2002: Avg. high temp., 62.4°, avg. low temp., 39.3°; precipitation 4.61 in.
Records: high, 77° (5/24); low, 27° (5/20)

May 30-year avg. high temp., 65° low temp., 41° ; precipitation 3.70 in.

June 2002 Avg. high temp., 69.8°, avg. low temp., 49.9°; precipitation 4.55 in.
Records: high, 88 (6/27); low, 33° (6/8)

June 30-year avg. high temp., 74° low temp., 50° ; precipitation 3.40 in.

July 2002 Avg. high temp., 78.5°, avg. low temp., 67.1°; precipitation 1.95 in.
Records: high, 96° (7/3); low, 46° (7/11)

July 30-year avg. high temp., 79° low temp., 56° ; precipitation 3.10 in.

August 2002 Avg. high temp., 80.9° avg. low temp., 56.5°; precipitation 1.90 in.
Records: high 95° (8/13); low, 40° (8/31)

August 30-year avg. high temp., 77° low temp., 54° ; precipitation 3.10 in.

Ferns that received a lower rating either require a different environment for maximum performance, were damaged by insects, or just seemed to be struggling. Examples are *D. villarii*, which prefers an alkaline environment, and *D. filix-mas* 'Crispitissima,' which evidently suffered insect damage, and *D. hondoensis*, which did very well at the beginning of the summer but looked poorly in late August, perhaps as a result of the extended period of very hot weather.

We give credit to the horticultural staff of CMBG for their excellent care of the plants. The plants are watered by drip irrigation and are thickly mulched. This care, we believe, prevented some species from dying or going dormant.

How would you like to see this evaluation process changed and improved?

Some sort of definition of "garden worthiness" would be helpful. Which criterion is more important: aesthetics or plant health? The two do not always go together.

continued on page 76

Garden name: Georgeson Botanical Garden

Genus, Species, Variety or Cultivar	Year Planted	# Of Ferns Alive	Average Frond Length (In.)	Has It Borne Spore In The Past Year	Garden Worthiness Rate 1-5 Low to High
<i>Polystichum braunii</i>	1995	4/10	24	Yes	3
<i>Dryopteris fragrans</i>	1993	1/10	15	Yes	3
<i>Matteuccia struthiopteris</i>	1996	4/4	40	Yes	5

The growing season was fairly normal for Alaska with a seasonal high of 83°F and a low of -35°F. Some ferns died because of lack of snow cover. By the end of December, recorded snowfall was 13 inches at the weather station, but the ferns in our shade house received about half that. Most ferns that were growing poorly, died, and the only ones remaining are native ferns. The single remaining *Dryopteris crassirhizoma* emerged at the end of June, then died. This is a sign of crown damage caused by freezing temperatures.

Garden name: Harry P. Leu Gardens

Genus, Species, Variety or Cultivar	Year Planted	# Of Ferns Alive	Average Frond Length (In.)	Has It Borne Spore In The Past Year	Garden Worthiness Rate 1-5 Low to High
<i>Dryopteris bissetiana</i>	2000	2	5'	Yes	3.5
<i>Dryopteris celsa</i>	1998	3	12"	Yes	5
<i>Dryopteris clintoniana</i>	2000	2	5'	No	2
<i>Dryopteris filix-mas</i> 'Crispatissima'	2001	2	4'	No	2
<i>Dryopteris lacera</i>	2000	3	12"	Yes	5
<i>Dryopteris pacifica</i>	2000	3	10"	Yes	5
<i>Dryopteris pycnopteroides</i>	2000	3	8'	Yes	4
<i>Dryopteris scottii</i>	2001	3	12"	Yes	4

<i>Dryopteris sieboldii</i>	1998	3	10"	Yes	4.5
<i>Polystichum aculeatum</i>	2001	3	6"	No	3
<i>Polystichum polyblepharum</i>	1998	2	12"	Yes	5
<i>Polystichum setiferum</i>	2000	3	12"	Yes	4

The coldest temps for winter 2001-2002 were appx. 30°F. Winter was warm but dry. Spring 2002 was hot and dry. Summer 2002 has been normal with temps, 90-95°F day and 75-80°F night, and rainy. We have had nearly 40" of rain since June 1, 2002.

Garden name: Inniswood Metro Gardens October 11, 2002

Genus, Species, Variety or Cultivar	Year Planted	# Of Ferns Alive	Average Fron Length (In.)	Has It Borne Spore In The Past Year	Garden Worthiness Rate 1-5 Low to High
<i>Athyrium</i> f.-f. 'Vernoniae Cristata'	1994	3	24 in	Yes	5
<i>Athyrium</i> f.-f. 'Frizelliae'	1999	3	12 in	No	5
<i>Blechnum</i> spicant	1999	2	8 in	No	4
<i>Cyrtomium</i> macrophyllum	1998	3	10 in	Yes	5
<i>Dryopteris</i> lacera 'Affinity'	1999	3	18 in	Yes	5
<i>Dryopteris</i> affinis	1996	2	10 in	No	3
<i>Dryopteris</i> affinis 'Crispa Barnes'	1998	5	18 in	Yes	5
<i>Dryopteris</i> x australis	2001	3	20 in	Yes	5
<i>Dryopteris</i> bissetiana	1999	3	11 in	Yes	5
<i>Dryopteris</i> erythrosora	1994	4	20 in	Yes	5
<i>Dryopteris</i> hondoensis	2001	2	14 in	No	5
<i>Dryopteris</i> pacifica	2001	2	13 in	Yes	5

continued on page 78

Garden Evaluations *continued from page 77*

<i>Dryopteris polylepis</i>	1999	3	12 in	No	5
<i>Dryopteris pseudo-filix-mas</i>	1996	4	30 in	Yes	5
<i>Dryopteris pseudo-filix-mas</i>	1998	5	16 in	No	5
<i>Dryopteris pycnopteroides</i>	2001	3	10 in	Yes	5
<i>Dryopteris remota</i>	1998	1	10 in	No	4
<i>Dryopteris sacrosancta</i>	1995	5	14 in	Yes	5
<i>Dryopteris sieboldii</i>	1999	2	4 in	No	1
<i>Dryopteris wallichiana</i>	1995	3	22 in	Yes	5
<i>Dryopteris filix-mas</i> 'Crispatissima'	2001	3	10 in	No	5
<i>Phyllitis scolopendrium</i>	1994	2	12 in	Yes	5
<i>Polystichum aculeatum</i>	2001	3	12 in	Yes	5
<i>Polystichum andersonii</i>	1996	5	10 in	Yes	5

We had an average winter for central Ohio, and a lovely (for the ferns) moist cool spring. However, during the summer we had several weeks of very hot, in the nineties, weather, associated with a severe drought. Some ferns weathered the extreme conditions very well, others did not. We lost several young plants, and a few older ones, in spite of frequent watering. It is possible that some of these became dormant and will reappear next spring. Some survived, but did not reach their usual size.

Garden name: Lewis Ginter Botanical Garden, Richmond, Virginia

Genus, Species, Variety or Cultivar	Year Planted	# Of Ferns Alive	Average Fron Length (In.)	Has It Borne Spore In The Past Year	Garden Worthiness Rate 1-5 Low to High
<i>Adiantum aleuticum</i>	1999	1	13"	Yes	2
<i>Athyrium filix-femina</i> 'Frizellae'	1999	3	8"	No	3
<i>Athyrium niponicum</i> 'Branford Beauty'	2001	3	15"	Yes	4
<i>Cryptomium falcatum</i> 'Rochfordianum'	1998	2	18"	No	3
<i>Cryptomium fortunei</i>	1998	5	24"	Yes	5
<i>Cryptomium macrophyllum</i>	1998	3	12"	No	2
<i>Dryopteris affinis</i> var. <i>Azorica</i>	1998	4	16"	No	2
<i>Dryopteris bissetiana</i>	1999	2	16"	Yes	2
<i>Dryopteris blandfordii</i>	1998	5	20"	Yes	4
<i>Dryopteris celsa</i>	1998	3	36"	Yes	4
<i>Dryopteris championii</i>	1998	1	16"	Yes	3
<i>Dryopteris clintoniana</i>	2000	2	12"	Yes	3
<i>Dryopteris corleyi</i>	1999	3	19"	Yes	3
<i>Dryopteris crassirhizoma</i>	1998	2	24"	Yes	5
<i>Dryopteris cristata</i>	1999	3	27"	Yes	4
<i>Dryopteris filix-mas</i> 'Crispatissima'	2001	3	9"	No	3
<i>Dryopteris hondoensis</i>	2001	3	10"	No	5
<i>Dryopteris pacifica</i>	2000	3	13"	Yes	3

continued on page 80

Garden Evaluations *continued from page 79*

<i>Dryopteris polylepis</i>	2000	3	20"	Yes	3
<i>Dryopteris pycnopteroides</i>	2000	1	17"	Yes	3
<i>Dryopteris sieboldii</i>	1999	3	16"	Yes	4
<i>Dryopteris sieboldii</i>	1998	3	28"	Yes	4
<i>Dryopteris stewartii</i>	1998	2	24"	Yes	3
<i>Dryopteris sublacera</i>	1998	1	13"	No	2
<i>Dryopteris x australis</i>	2000	3	24"	Yes	4
<i>Polypodium scolieri</i>	2001	3	5"	No	3
<i>Polystichum aculeatum</i>	2001	3	14"	No	3
<i>Polystichum neolobatum</i>	1998	2	12"	Yes	5
<i>Polystichum setiferum</i>	1999	2	22"	Yes	3

We continue to experience drought conditions in Central Virginia. As of September 1st, 2002 we were 8.08 inches below average for annual rainfall. The summer has been characterized by consistently higher than normal temperatures with little rain. The official high temperature for the year was 100 degrees in August and the official low 14 degrees in February.

Garden name: Rhododendron Species Botanical Garden

Genus, Species, Variety or Cultivar	Year Planted	# Of Ferns Alive	Average Frond Length (In.)	Has It Borne Spore In The Past Year	Garden Worthiness Rate 1-5 Low to High
<i>Adiantum aleuticum</i> 'Subpumilum'	1990	6	8-10"	Yes	5
<i>Adiantum pedatum</i>	1990	1	28"	Yes	5
<i>Adiantum venustum</i>	1990	Many patches	22"	Yes	5
<i>Adiantum viride-montanum</i>	1990	1	27"	No	4
<i>Arachnoides simplicior</i> var. <i>major</i>	1990	4	18"	Yes	3

<i>Asplenium trichomanes</i>		many	6'	Yes	5
<i>Asplenium trichomanes</i> 'Incisum'	1991	4	11"	Yes	4
<i>Athyrium niponicum</i> 'Pictum'	1990				
<i>Athyrium otophorum</i>	1990	5	12-18"	Yes	5
<i>Blechnum cordatum</i>	1999	12	10-36"	Yes	5
<i>Blechnum niponicum</i>	2000	3	5'	Yes	2
<i>Blechnum penna-marina</i>	1993	Many	11"	Yes	5
<i>Blechnum spicant</i>	1990	Many	36"	Yes	5
<i>Blechnum spicant</i> 'Serratum Rickard'	1990	4	28"	Yes	4
<i>Ceterach officinarum</i>	2001	3	3"	Yes	5
<i>Cheilanthes lendigera</i>	?	1	6"	No	2
<i>Cyrtogramma crista</i>		4	14"	Yes	5
<i>Cyrtomium caryotideum</i>	1991	4	20"	Yes	4
<i>Cyrtomium lonchitoides</i>	1994	8	18"	Yes	4
<i>Cyrtomium macrophyllum</i>	1990	4	26"	Yes	4
<i>Doodia media</i>	1999	12	12-14"	Yes	4
<i>Dryopteris affinis</i>	2001	3	36"	Yes	5
<i>Dryopteris bissetiana</i>	1999	3	10"	Yes	4
<i>Dryopteris blanfordii</i>	1997	7	26"	Yes	5
<i>Dryopteris celsa</i>	1994	3	24"	Yes	4
<i>Dryopteris championii</i>	1990	1	7"	No	3
<i>Dryopteris corleyi</i>	1999	5	22"	Yes	4
<i>Dryopteris cycadina</i>	1990	2	18"	Yes	3

continued on page 82

Garden Evaluations *continued from page 81*

<i>Dryopteris cystolepidota</i>	1994	7	27"	Yes	5
<i>Dryopteris dilatata</i>	1990	3	18"	Yes	5
<i>Dryopteris erythrosora</i>	1990	9	22"	Yes	5
<i>Dryopteris erythrosora</i> 'Prolifica'	1990	3	8"	No	4
<i>Dryopteris expansa</i>		Many	36-48"	Yes	4
<i>Dryopteris filix-mas</i>	1990	2	42"	Yes	5
<i>Dryopteris formosana</i>	1991	7	20"	Yes	5
<i>Dryopteris cashmiriana</i>	1999	7	22"	Yes	4
<i>Dryopteris lacera</i>	1990	1	18"	No	3
<i>Dryopteris lepidopoda</i>	1994	4	24"	Yes	5
<i>Dryopteris ludoviciana</i>	1990	2	11"	No	3
<i>Dryopteris marginalis</i>	1999	13	12"	Yes	3
<i>Dryopteris namegatae</i>	2001	3	24"	Yes	4
<i>Dryopteris oreades</i>	1999	2	18"	Yes	3
<i>Dryopteris pacifica</i>	1999	9	15"	Yes	4
<i>Dryopteris polylepis</i>	1990	1	23"	Yes	4
<i>Dryopteris polylepis</i>	2000	12	14"	Yes	4
<i>Dryopteris pseudo filix-mas</i>	1990	6	24"	Yes	5
<i>Dryopteris pycnopteroides</i>	1992 & '99	11	10-15"	Yes	3
<i>Dryopteris sacrosancta</i>	1996	8	18"	Yes	4
<i>Dryopteris scottii</i>	2001	12	9"	Yes	2
<i>Dryopteris sieboldii</i>	1990 & '97	11	24"+	Yes	4
<i>Dryopteris stewartii</i>	1998	5	20"	Yes	3

<i>Dryopteris tokyoensis</i>	2001	5	32"	Yes	5
<i>Dryopteris uniformis</i>	1999	11	20"	Yes	4
<i>Dryopteris wallichiana</i>	1999	11	30"	Yes	5
<i>Dryopteris x australis</i>	2000	5	20-24"	Yes	5
<i>Dryopteris x australis</i>	2000	5	34"	Yes	5
<i>Gymnocarpium dryopteris</i>	1990	Many	8"	Yes	5
<i>Gymnocarpium dryopteris</i> 'Plumosum'	1990	Many	8"	Yes	5
<i>Gymnocarpium oyamense</i>	1997	4 patches	10"	Yes	4
<i>Hypolepis punctata</i>	1996	1 patch	18"	Yes	3
<i>Matteuccia struthiopteris</i>	1990	Many	26"	Yes	4
<i>Onoclea sensibilis</i>		Lg. Patch	29"	Yes	4
<i>Osmunda cinnamomea</i>	1997	Many	52"	Yes	5
<i>Osmunda claytoniana</i>	1990	1	14"	Yes	2
<i>Osmunda regalis</i>	1996	Many	48"	Yes	5
<i>Phyllitis scolopendrium</i>	1990	7-10	10-23"	Yes	5
<i>Polypodium interjectum</i>	1998	3	8-10"	Yes	3
<i>Polypodium scolieri</i>	1990	Lg. Patch	18"	Yes	5
<i>Polystichum acrostichoides</i>	1990	5	14"	Yes	3
<i>Polystichum aculeatum</i>	1990	1	18"	Yes	3
<i>Polystichum aculeatum</i>	2001	9	15"	Yes	3
<i>Polystichum braunii</i>	1990	5	12"	Yes	5
<i>Polystichum californicum</i>	1991	3	10"	Yes	2
<i>Polystichum falcinellum</i>	2000	1	2"	No	1

continued on page 84

Garden Evaluations *continued from page 83*

<i>Polystichum makinoi</i>	1991	9	12-24"	Yes	5
<i>Polystichum neolobatum</i>	1991	4	12"	Yes	5
<i>Polystichum polyblepharum</i>	1990	Many	12-15"	Yes	5
<i>Polystichum polyblepharum</i>	2001	30+	12"	Yes	5
<i>Polystichum retrosopalaecum</i>	1990	1	24"	Yes	3
<i>Polystichum rigens</i>	2001	9	22"	Yes	3
<i>Polystichum squarrosum</i>	2001	2	10"	Yes	4
<i>Polystichum tsus-simense</i>	1990	5	15"	Yes	5
<i>Polystichum x illyricum</i>	1990	1	16"	Yes	2
<i>Polystichum xiphophyllum</i>		3	16"	Yes	3
<i>Rumohra adiantiformis</i>	1999	4	3-8"	Yes	1
<i>Thelypteris decursive-pinnata</i>	1990	Many patches	15-18"	Yes	5
<i>Thelypteris phegopteris</i>	1990	Many patches	18"	Yes	5
<i>Woodsia intermedia</i>	2000	4	6"	Yes	5
<i>Woodsia obtusa</i>	1990	1Eaten by something		No	Normally a 4 or 5
<i>Woodsia polystichoides</i>	1999	6	5-6"	Yes	5
<i>Woodwardia areolata</i>	1990	Many	12"	Yes	5
<i>Woodwardia fimbriata</i>		1	30"	Yes	5
<i>Woodwardia unigemmata</i>	2000	3	36"	Yes	5

We experienced a mild winter with some freezing temperatures late in October. Our first frost in the nursery was November 6th. December through March was somewhat mild, our lowest recorded temp was 26 F. We had a very light snow the latter part of January. Our warmest recorded day was 88 F on July 10th. Our ferns are really starting to become established since the renovation of our upper woodland garden in 1999. Rhododendrons and other shrubs and trees are beginning to fill in a bit, providing some of the shade that was lost after transplanting. The "base" soil, brought in for the Rhodies, consisted of mainly sand and bark. We've amended the soil each spring by adding a mulch of organic matter around the ferns.

Garden name: Stephen F. Austin State University Arboretum

Genus, Species, Variety or Cultivar	Year Planted	# Of Ferns Alive	Average Frond Length (In.)	Has It Borne Spore In The Past Year	Garden Worthiness Rate 1-5 Low to High
<i>Cyrtomium caryotideum</i>	97	5	12-14	Yes	3
<i>Cyrtomium falcatum</i> 'Rochfordianum'	98	5	24-28	Yes	5
<i>Cyrtomium fortunei</i>	97	5	15-18	Yes	5
<i>Cyrtomium macrophyllum</i>	97	5	14-18	Yes	3
<i>Dryopteris affinis</i> 'The King'	97	1	8-10	Yes	2
<i>Dryopteris affinis</i> var. <i>Azorica</i>	98	3	8-12	Yes	3
<i>Dryopteris bissetiana</i>	99	2	10-12	Yes	3
<i>Dryopteris celsa</i>	98	1	15-18	Yes	5
<i>Dryopteris championii</i>	97	1	18-24	Yes	5
<i>Dryopteris corleyi</i>	99	2	10-12	Yes	3
<i>Dryopteris filix-mas</i> 'Crispatissima'	01	2			
<i>Dryopteris lacera</i> affinity	98	3	10-14	Yes	5
<i>Dryopteris pacifica</i>	00	3	12-14	Yes	5
<i>Dryopteris pseudo filix-mas</i>	97	5	15	Yes	5
<i>Dryopteris pycnopteroides</i>	00	3	12-14	Yes	5
<i>Dryopteris sacrosancta</i>	97	5	12-14	Yes	5
<i>Dryopteris scottii</i>	01	1			
<i>Dryopteris sieboldii</i>	97	3	12	Yes	3

continued on page 86

Garden Evaluations *continued from page 85*

Dryopteris stewartii	98	2	14-16	Yes	4
Dryopteris x australis	00	3	15-18	No	5
Polystichum aculeatum	01	3			
Polystichum setiferum	97	2	12-15	Yes	4

The low temperature during the last year was 19 degrees. We had a few days over 100 degrees during late summer. The ferns that are not doing well cannot take our hot summers and fall. During the last four years we have had a drought in late summer and early fall.

Forms of the American Christmas Fern (*Polystichum acrostichoides*). Part III. Plants That Merit Attention.

John D. Scott - Rockland Botanical Garden

This is the concluding part of this series of articles on the forms of the Christmas Fern. I'd like to thank the many contributors of information on living material and hope others can find lost plants or can contribute specimens to our living collection. As information on spore grown plants and stability of forms becomes available we will publish an update.

Part IIIa. Living Plants

The typical form of Christmas Fern has garden merit in its own right. The characters of discrete little 'boots' and the evergreen fronds set it apart from the typical fancy fern frond. Christmas Ferns aren't fussy about garden culture. They will grow in almost any soil. They can tolerate wet or dry soil. And they can tolerate a fair amount of sun without yellowing.

Below are the best living forms that have been proven to divide well and remain true to form. I have not seen any of them offered in the trade and have no data on the stability of the forms grown from spore.

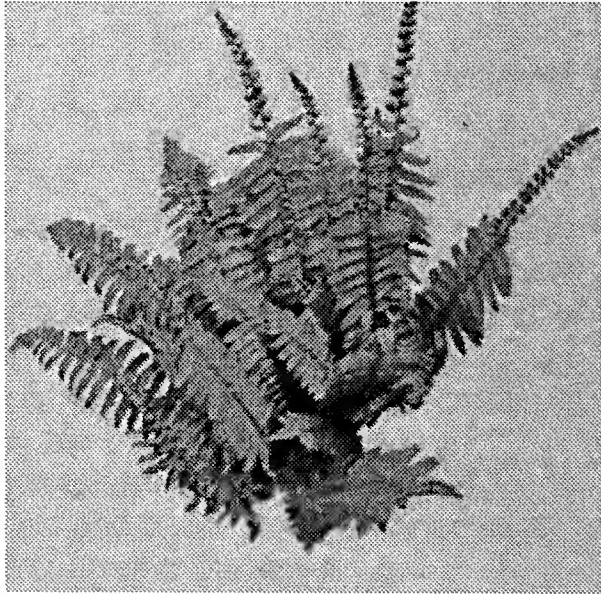
Figure 1

Prolific Form

Paulinskill Valley Trail

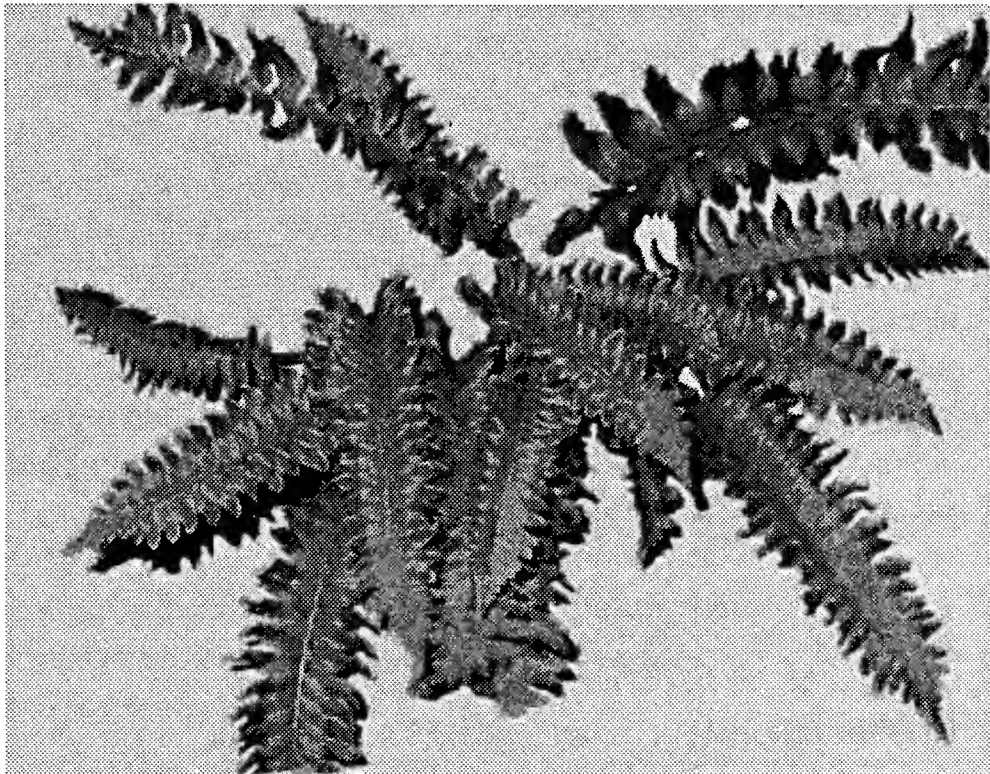
Warren Co., NJ

Live Plant



Correcton: In part 1 the text for the ‘prolific’ form (figure 29) incorrectly stated photographed on the Sussex Branch Trail in Suffix Co., NJ. The figure caption is correct. i.e. Paulinskill Valley Trail, Warren Co., NJ. The black and white photograph does not do justice to the bright tan ‘flowering’ of the fertile top third of the frond. It is still to be determined whether this form is stable or a freak of the last few summers of drought.

Figure 2
Wavy Form
RBG Plant



This is the best of the wrinkled, wavy or twisted forms. Pinnae were illustrated in Part 1, Figs. 23, 24, 25 and 26. It has remained sterile. Source is the Rockland Botanical Garden woods.

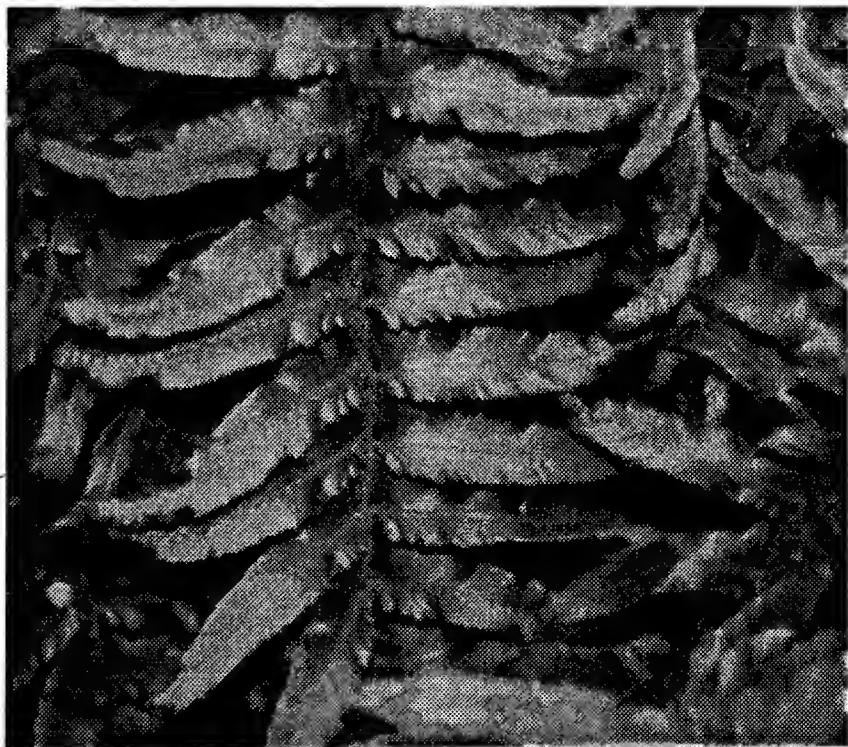


Figure 3
Forma *incisum*
FM Mooberry’s Garden,
Kennett Square PA

Pinna illustrated in part 1, Figure 17.

continued on page 88

Forms of The American Christmas Fern *continued from page 87*

While incised fronds can come spontaneously on a normal plant in late summer, FM's plant is stable and entirely of the thick coarse incised fronds. It also has sori all the way down to the lowest pinnae as stated many times in the literature. The photo was taken on May 24th. I've seen a similar plant in Susquehanna State Park, MD. As to the name – the incised form was first published by Beck in 1833 as *Aspidium schweinitzii*. It has been listed by several authors as var. *schweinitzii*. Therefore, I believe that the proper name is *Polystichum acrostichoides* f. *schweinitzii* (Beck) Scott comb. nov.

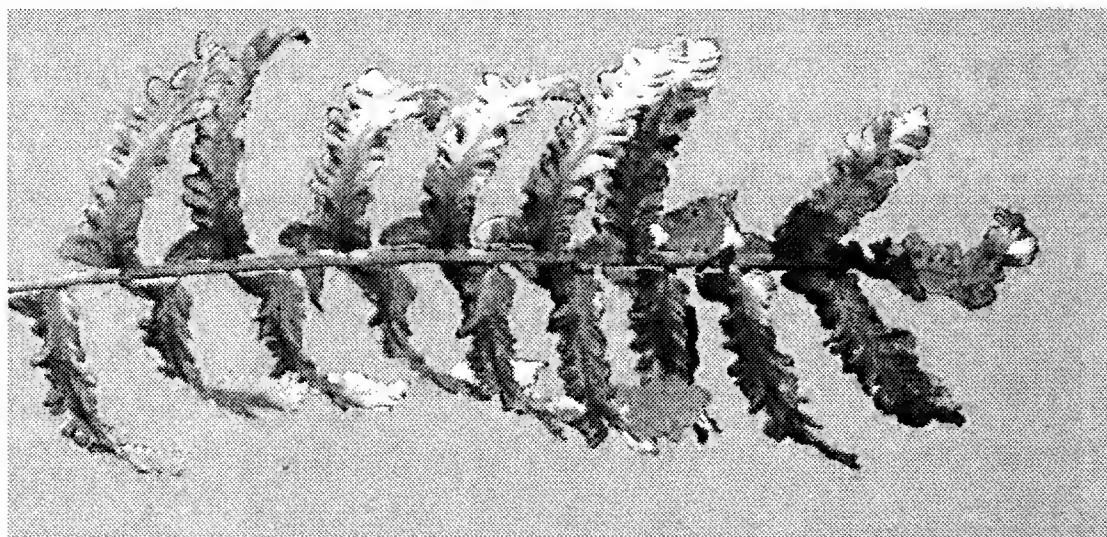
The following 3 specimens came to me from Charlotte Shaefer of Broomal, PA. Charlotte was the mother of a high school classmate of mine and a friend of my high school biology teacher. They introduced me to "botanizing". Charlotte, who regularly chauffeured Dr. Wherry around, often took me along. Charlotte was a student of Dr. Wherry's at the Barnes Foundation and was allowed to divide many of the ferns that Dr. Wherry placed in the Laura Barnes wildflower woods. In the nineteen seventies and eighties Dr. Wherry and I traveled to many of his fern localities in southeastern Pennsylvania and adjacent Maryland and New Jersey to relocate some of his early finds. I've had these plants for over forty years, dividing them occasionally.

Figure 4

Forma

crispum

RBG Plant



Pinna illustrated in Part 1, Figure 22.

Figure 4 is of a division of Dr. Wherry's (1947) original plant from Mr. Vick's Glenmoore, PA woods. Vick was the owner of Vick's wildflower nursery in Conshohocken, PA. He introduced many of Dr. Wherry's wildflower and fern discoveries into the trade. Herbarium specimens from 1947 are at ANSP. The original plant is still at the Barnes Arboretum.

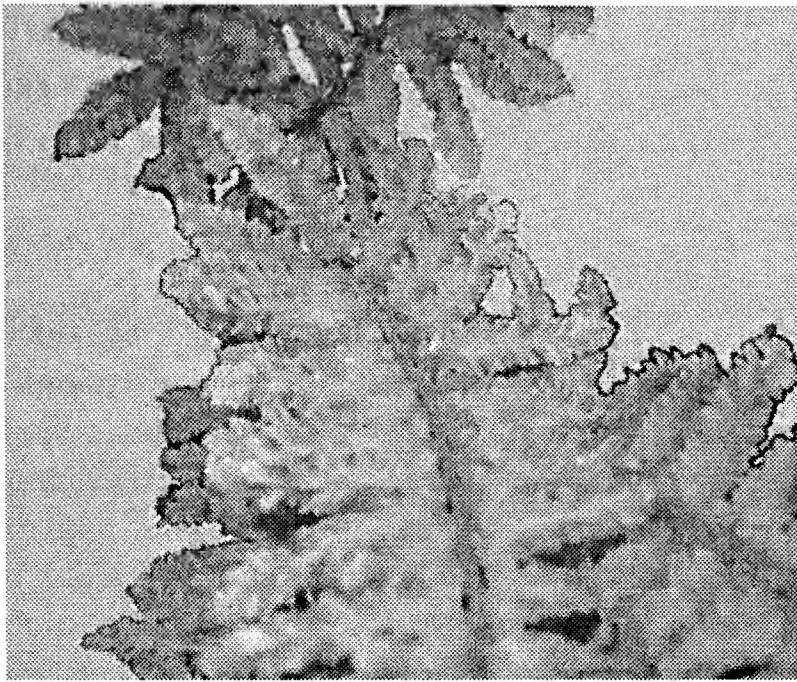


Figure 5
Forma *multifidum*
RBG Plant

Pinna illustrated in Part 1, fig 20 .

I haven't found an original source for Wherry's specimens of '*multifidum*'. This plant is also from the Barnes Arboretum where the original plant still resides.

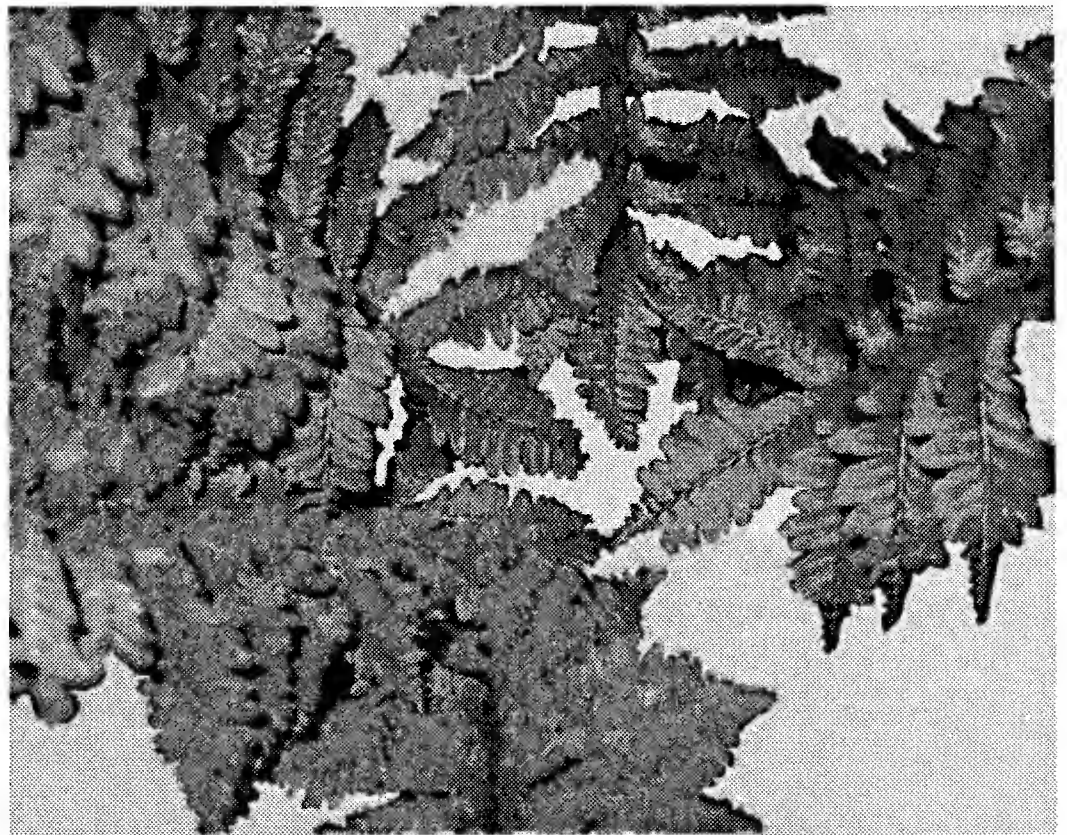


Fig 6
Bipinnate form
RBG Plant

Pinna illustrated in Part 1, Figure 21

continued on page 90

Forms of The American Christmas Fern *continued from page 89*

Dr. Wherry and I obtained additional divisions of this bipinnate form (Figure 6) from Miss Emma Groff's garden in Lancaster, PA. She had collected it in the woods near her home in the 1923. (ANSP)

Wagner (1942) covers in detail bipinnate plants from Virginia, but he didn't introduce a name. Wherry (1963) illustrated this form (Figure 'f' upper figure) as a variant of *multifidum*. Miss Groff's plant has well developed lower pinnae. The Wagner specimens have many more bipinnate pinnae further along the rachis. Wagner's herbarium distribution is at ANSP. Wherry collected specimens in Virginia (ANSP) but I haven't found any mention of living plants. This plant from Barnes Arboretum looks like the Virginia material. If any plant deserves a name it is this one. Based on Wagner's article I name it *Polystichum acrostichoides* forma *bipinnatum* Scott forma nov. Type specimen is ANSP 809370. Wagner's handwritten label reads: bipinnate colony along stream banks near Difficult Run, about 3 mi. NW of Tyson's Crossroads, Fairfax County, VA. Warren H. Wagner, Jr. with Carroll E. Wood. No 239. Coll. Jan. 26, 1942.

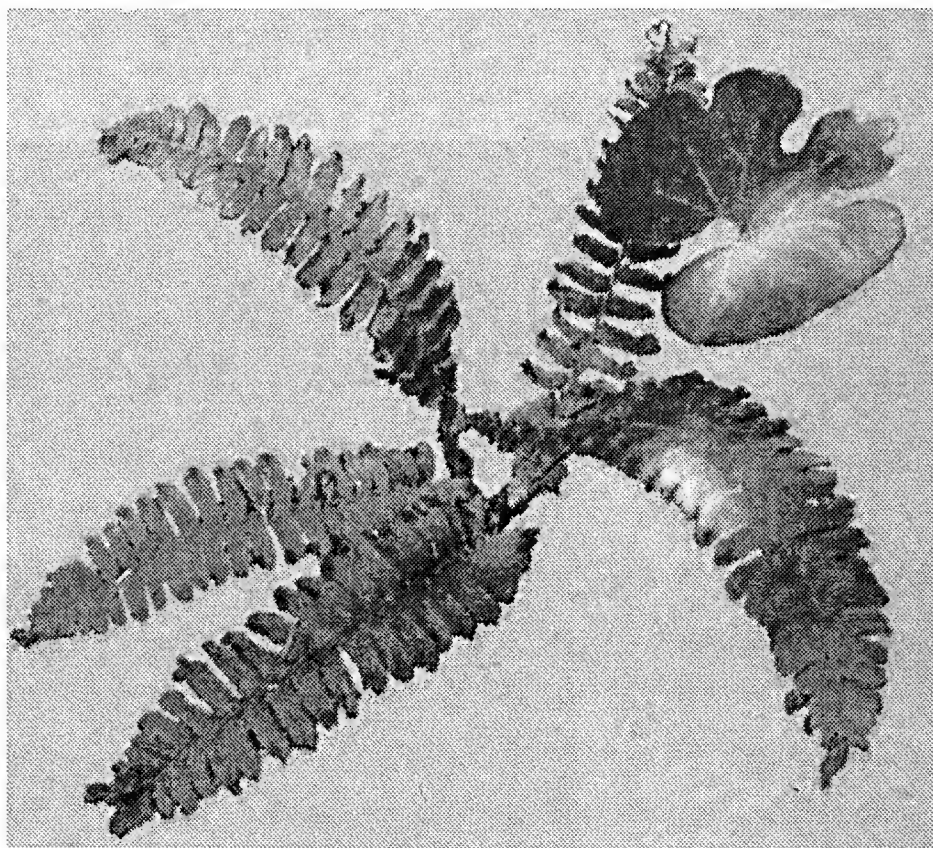
Fig 7

Tufted form

Forma

***cristatum* (Clute)**

RBG plant



Pinna illustrated in Part 1, Figure 6

I don't have records for the original source of this neat little form but it is small – less than 8 inches long and neatly tufted at the end. This plant was sterile for 40 years, but has produced one fertile, tufted frond the last two years.

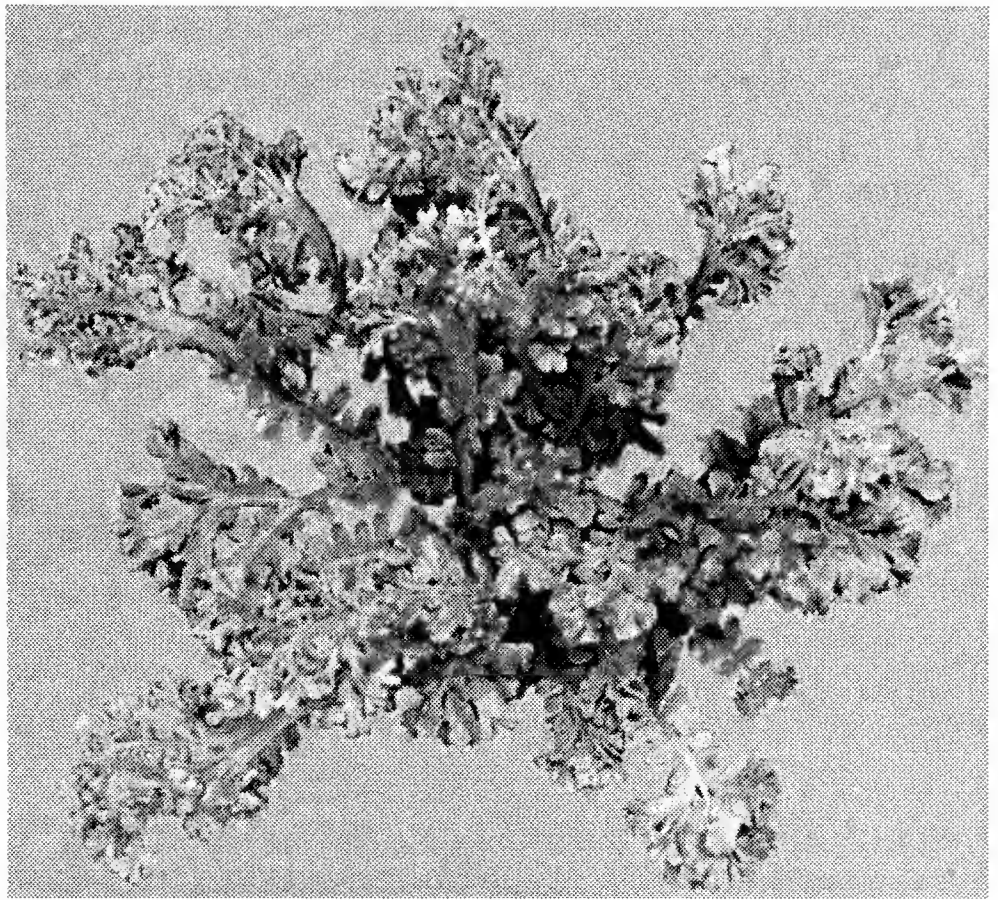
Figure 8

**Form ‘*cristatum*
nanum’**

Unpublished name

Roswitha Möller

Germany



This little gem comes from Ms. Roswitha Möller in Germany. It was not shown in either part I or part II. She related that “it was in a garden center among plants labeled ‘*cristatum*’ but was clearly different. In four years it is only 15 cm (6 inches) in length. The single plant will be divided this year and plants grown from spore are being raised.” The name is hers.

Part IIIb. Plants on herbarium sheets only.

The remaining forms have only been seen on herbarium sheets. However, the data indicates they may be relocated and deserve searching for. Each one has an interesting tale to tell.

continued on page 92

Figure 9

Spiralled form

USMN

Amhurst, Mass.

R. A. Doray

August 24, 1944

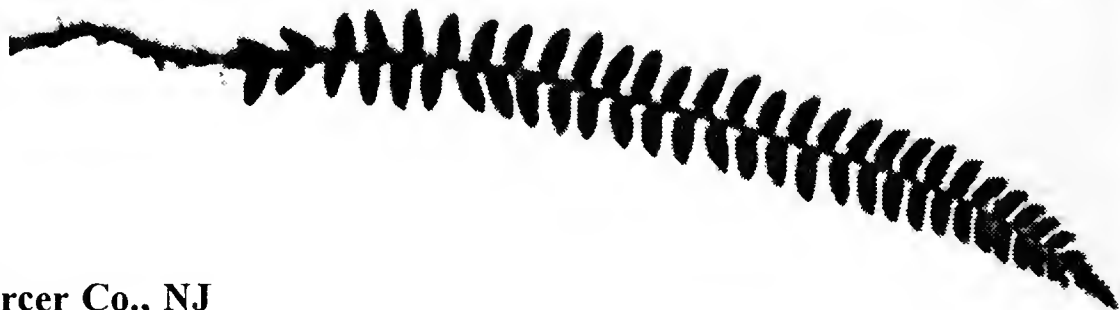


Illustrated in Part II, Figure 4

This spiralled form has been observed only once on the specimen shown here. The herbarium sheet (USNM 2200221) has 2 fronds. The specimen is 16.2 cm (6.4 in) long by 8.4 cm (3.3 in) wide. Mr. Doray contributed many Christmas Fern specimens and presumably others to the US National Herbarium.

Figure 10

Narrow Form



ANSP

Princeton, Mercer Co., NJ

November 10, 1884

John E. Peters

Illustrated in Part II, Figure 2

The narrow frond occurs occasionally with a variety of pinnae types, including normal pinnae shown here. The frond in figure 10 is 31.4 cm (12.4 in) × 2.7 cm (1.1 in)

Figure 11
Lacerated form
USNM
Surrey Co., VA
F. R. Fosberg
1.29.1940



Illustrated in Part one, figure 14 and Part II, figures 7 and 8

Dr. Wherry didn't care much for these forms and dubbed them 'monstrosities.' The Victorians, however, had hundreds of named forms of lady (*Athyrium filix-femina*), male (*Dryopteris filix-mas*) and hart's tongue (*Phyllitis scolopendrium*) ferns. In the right garden setting they can be at least 'interesting.' I've yet to find a living plant, but there are many occurrences of this type of mutation in the herbarium specimens. Figure 11 is a complete plant collected by F. R. Fosberg in Virginia in 1940 (USNM 2201450). He labeled it 'lasciated.'

continued on page 94

Forms of The American Christmas Fern *continued from page 93*

Another interesting plant that deserves searching for is USNM 1874986. The herbarium specimen was collected by E. M. Kittredge. Miss Kittredge was very active in the American Fern Society in the early 1900s. She published often in the Society's Fern Journal. The specimen is labeled "and is now growing in the Miss Billings' fernery, Bartran, VT." It turns out that Bartran is just 37 miles east of West Haven, my in-law's Vermont summer home! The search for this plant should be interesting.

A third set of three specimens from the herbarium of Robert A. Doray (USNM 2200237, 8.20.46; 2200236, 8.20.49; and 2200234, 6.10.49) were from the garden of H. G. Rugg, Hanover, N.H. Apparently Doray visited Rugg's garden many times. From the number of times collected, it is expected that stable plants do exist. [Rugg is best remembered as the discoverer of the hybrid royal fern *Osmunda* × *ruggii* (*O. claytoniana* × *regalis*). As with the British 'monstrosities' growth from spores may or may not give consistent results.]

Acknowledgments:

My sincere thanks to those who arranged access to the materials used in this study. Access to herbarium specimens was provided by Ernie Schuyler (ANSP), James Macklin (ANSP), David Lellinger (USNM), Greg McKee (USNM), John Mickel (NYBG), Robbin Moran (NYBG). Photocopies of Tryon photos of the Michaux type specimen and the type of *P. a. orbiculatum* were sent by Emily Wood of the Gray's Herbaria, Harvard University. Xeroxing of material at the Academy of Natural Science Philadelphia was aided by Eileen Mathias. Living material was seen at the following: my garden (Rockland Botanical Garden, Mertztown, PA), the John Mickels' Garden (Tarrytown, NY), the Foster collection (NYBG), Canticler (Devon, PA), FM Mooberry (Kennett Square, PA) and the Barnes Arboretum (Bala Cynwd, PA). Finally thanks to Roswitha Möller (Germany) for photos of *Polystichum acrostichoides* form '*cristatum namum*', and Bill Plummer (NY) for a specimen of the wavy form.

Post Script:

Hopefully Clute's type specimens (Indiana University) will reappear and the Reed Herbarium (Field Museum) material will become available. Also, perhaps more living specimens will become available.

John Scott

Rockland Botanical Garden

johndscott@mindsping.com

Bibliography:

- BECK, L. C. (1833) *Botany of the Northern and Middle States North of Virginia*. p. 449. [Publication of *Aspidium schweinitzii* Beck.]
- BENEDICT, R. C. (1922) Variation in Ferns. *Amer. Fern J.* 13: 93,96, 95? ["Mr. Weatherby has written outlining five types of Christmas ferns which he has seen....."]
- BROUN, M. (1938) *Index to the North American Ferns*.: pp. 145-146. [Lists 12 named forms of *Polystichum acrostichoides*.]
- CLUTE, W. N. (1896a) The Chapter Ferns. *Fern Bulletin* 4(1): 10-11. [Note on "incisa" or "more Properly *D. a. schweinitzii*."]
- CLUTE, W. N. (1896b) Forking Fronds. *Fern Bulletin* 4(2): 25. [*D. acrostichoides* var. *incisa*.]
- CLUTE, W. N. (1896c) *Fern Bulletin* 4(4): 66. [Mr. Will R. Maxon sends forking in *Asplenium acrostichoides*.]
- CLUTE, W. N. (1901) *Our Ferns in Their Haunts*. p. 107. [Publication of variety *crispum* without drawing and gives a drawing of variety *incisum*.]
- CLUTE, W. N. (1904) A New Form of the Christmas Fern. *Fern Bull.* 12: 79. [Publication of *Polystichum acrostichoides* forma *recurvatum*.]
- CLUTE, W. N. (1907) Rare Forms of Ferns—IV. A Bipinnatifid Christmas Fern. *Fern Bull.* 15: 71-72. [Publication of *Polystichum acrostichoides* f. *multifida*. With drawing. Notes Eaton's (1867) illustration.]
- CLUTE, W. N. (1912a) Rare Forms of Fernworts—XXI. Another Form of the Christmas Fern. *Fern Bull.* 20: 24-25. [Publication of form *lanceolatum*. With drawing.]
- CLUTE, W. N. (1912b) Rare Forms of Fernworts—XXII. Still Another Christmas Fern. *Fern Bull.* 20: 49-52. [Publication of *Polystichum acrostichoides* f. *gravesii* with drawing.]
- CLUTE, W. N. (1912c) Crested Christmas Fern. *Fern Bull.* 20: 80-81. [Publication of *Polystichum acrostichoides* f. *cristatum*.]
- EAMES, E. H. (1931) Further Additions to the Connecticut Flora. *Rhodora* 33: 168. [Publication of *Polystichum acrostichoides* (Mich.) Schott. f. *orbiculatum*.]
- EATON, D. C. (1879) *The Ferns of North America*. Vol. 1: Cassino. Salem, Mass. Pp. 257-262 pl. 34. [Publication of var. *incisum* with drawing and a description and drawing of what would later be called *multifidum*.]
- EATON, A. A. (1899) Fern Variation. *Amer. Fern J.* 7: 13. [Article on form *incisa*.]
- FERNALD, M. L. (1950) *Gray's Manual of Botany*. Eighth Edition. New York: Van Nostrand. Pp. 38-39. [Relists 7 of the many forms listed by Broun (1938).]
- GILBERT, B. D. (1901) Working List of N. Am. Pteridophytes (North of Mexico). p.19 [Lists f. *crispum* and f. *incisum*.]
- GRAY, A. (1848) *Man.* 632. [Publication of *Polystichum acrostichoides* var. *incisum*.]
- GRAY, A. (1856) *Man.* ed. 2. 599. [Publication of *Aspidium acrostichoides* var. *incisum* A. Gray. Title Page 1858, Copyright 1857. Author's Preface 1856. Gives synonym (*Aspidium schweinitzii* Beck).]
- GREENE, F. C. (1913) A New Hybrid Fern. *Amer. Fern J.* 3: 83-85. [Proposed that the form later considered to be form *multifidum* was *Polystichum acrostichoides* × *Dryopteris cristata*.]
- GREER, G. K. and B. C. MCCARTHY (1997) The antheridiogen neighborhood of *Polystichum acrostichoides* (*Dryopteridaceae*) on a native substrate. *Int. J. Plant Sci.* 158(6): 764-768.

continued on page 96

Forms of The American Christmas Fern *continued from page 95*

GRUBER, C. L. (1940) Ferns of Kutztown-Fleetwood Area. Amer. Fern J. 30: 48-49. [Published forma *lingulatum*.]

HOPKINS, L. S. (1907) The Fern Flora of Ohio. Fern Bull. 15: 7-8. [Asserted that variety *incisum* is only a later form of the type. Lists varieties *incisum* and *crispum*, with their intermediate forms, are of frequent occurrence.]

KITTREDGE, E. M. (1934) A Vermont Fern Garden. Amer. Fern J. 24: 84. [Description of the garden of Mrs. Chrisholm of Proctor, VT. Lists f. *lanceolatum* *multifidum* and other unnamed forms.]

MICHAUX, A. (1803) *Flora Boreali* p. 267. [Publication of Christmas Fern type as *Nephrodium acrostichoides*.]

NEIDORF, C. (1949) New Fern Variants from Westchester County, New York. Amer. Fern J. 39: 96-104. [Publication of forma *gymnosorum*, p. 103 and f. *ventroperiferis*, pp. 103-104, pl 9.

REED, C. F. (1951) New or Unusual Forms of Ferns from Maryland and Pennsylvania. Castanea 16: 65-70. [Publication of forms *demittens*, *recurvatum* and *spathiforme*. Correction of citation of *Polystichum acrostichoides* forma *multifidum*.]

SCHOTT, H. (1834) *Genera Filicum*. [Publication of the genus *Polystichum* (no page numbers.)

SMALL, J. K. (1893) The Altitudinal Distribution of the Ferns of the Appalachian Mt. System. Bull. Torr. Club, 20: 464. [Publication of name *Polystichum acrostichoides* var. *schweinitzii* (Beck) Small.]

TRYON, R. M., JR. (1938) The Phenomenon of Forking in Ferns. Amer. Fern J. 28: 81-90. [Presents figures of forking, lacerated, and normal combined with one 'multifidum' pinna.]

UNDERWOOD, L. M. (1893) 2nd ed. p. 111. *Our Native Ferns and Their Allies*.....[Lists var. *incisum*.]

WAGNER, W. H., JR. (1942) Bipinnate Christmas Ferns. Amer. Fern J. 32: 27-29.

WAGNER, W. H., JR. & D. R. Farrar and B. W. McAlpin (1970) Pteridology of the Highlands Biological Station Area, Southern Appalachians. J. Elisha Mitchel Sci. Soc. 86 (1): 1-27. [Pages 22- details the bipinnate Christmas Fern and its intergradation to form *incisum*.]

WEATHERBY, C. A. (1936) A List of Varieties and Forms of the Ferns of Eastern North America. Amer. Fern J. 26: 94-99. [Re-listed by Broun. (1938).]

WHERRY, E. T. (1947) A Crispate Variant of the Christmas Fern. Amer. Fern J. 37: 121. [Publication of a drawing for Clute's var. *crispum*.] Original drawing on herbarium sheet in USNM.

WHERRY, E. T. (1961) p. 100-101. *The Fern Guide*. [Drawings of 5 forms of Christmas Ferns.]

THE HARDY FERN FOUNDATION BOARD OF DIRECTORS

President: John van den Meerendonk

President Elect: Richie Steffen

Immediate Past President: Pät Kennar

Recording Secretary: Katie Burki

Corresponding Secretary: Sylvia Duryee

Treasurer: Lyman Black

Board Members:

Michelle Bundy

Guy Huntley

Sue Olsen

Meredith Smith

Nils Sundquist

Jeanie Taylor

Bors Vesterby

Members at Large:

Greg Becker

Naud Burnett

Joan Gottlieb

John Scott

Mary Ellen Tonsing

Inside Layout & Design by Karie Hess

Webmaster - Bors Vesterby

HARDY FERN FOUNDATION QUARTERLY

